Attachment A to Resolution No. 03-XXX

Proposed Amendment to the Water Quality Control Plan – Los Angeles Region to incorporate the Malibu Creek and Lagoon Bacteria TMDL

Proposed for adopted by the California Regional Water Quality Control Board, Los Angeles Region on December 4, 2003.

Amendments:

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Chapter 7. Total Maximum Daily Loads (TMDLs) Summaries, Section 10-5 (Malibu Creek and Lagoon Bacteria TMDL)

This TMDL was adopted by the Regional Water Quality Control Board on [Insert Date].

This TMDL was approved by:

The State Water Resources Control Board on [Insert Date].
The Office of Administrative Law on [Insert Date].
The U.S. Environmental Protection Agency on [Insert Date].

The following table includes the elements of this TMDL.

Table 7-10.1. Malibu Creek and Lagoon Basins Bacteria TMDL: Elements

Element	Key Findings and Regulatory Provisions
Problem Statement	Elevated bacterial indicator densities are causing impairment of the water contact recreation (REC-1) beneficial use in Malibu Creek and Lagoon and at beaches in proximity to the mouth of the watershed. Swimming in waters with elevated bacterial indicator densities has long been associated with adverse health effects. Specifically, local and national epidemiological studies compel the conclusion that there is a causal relationship between adverse health effects and recreational water quality, as measured by bacterial indicator densities.
Numeric Target *(Interpretation of the numeric water quality objective, used to calculate the waste load allocations and load allocations)*	The TMDL has a multi-part numeric target based on the bacteriological water quality objectives for marine and fresh water to protect the water contact recreation use. These targets are the most appropriate indicators of public health risk in recreational waters. These bacteriological objectives are set forth in Chapter 3 of the Basin Plan.[1] The objectives are based on four bacterial indicators and include both geometric mean limits and single sample limits. The Basin Plan objectives that serve as the numeric targets for this TMDL are: In Marine Waters Designated for Water Contact Recreation (REC-1) <u>1. Geometric Mean Limits</u> a. Total coliform density shall not exceed 1,000/100 ml. b. Fecal coliform density shall not exceed 200/100 ml. c. Enterococcus density shall not exceed 35/100 ml. <u>2. Single Sample Limits</u> a. Total coliform density shall not exceed 10,000/100 ml. b. Fecal coliform density shall not exceed 400/100 ml. c. Enterococcus density shall not exceed 104/100 ml. d. Total coliform density shall not exceed 1,000/100 ml, if the ratio of fecal-to-total coliform exceeds 0.1. In Fresh Waters Designated for Water Contact Recreation (REC-1) <u>1. Geometric Mean Limits</u> a. E. coli density shall not exceed 126/100 ml. b. Fecal coliform density shall not exceed 200/100 ml. <u>2. Single Sample Limits</u> a. E. coli density shall not exceed 235/100 ml. b. Fecal coliform density shall not exceed 400/100 ml.

[1] The bacteriological objectives were revised through a Basin Plan amendment adopted by the Regional Board on October 25, 2001, and subsequently approved by the State Water Resources Control Board, the Office of Administrative Law and finally by U.S. EPA on September 25, 2002.

Element	Key Findings and Regulatory Provisions
	These objectives are generally based on an acceptable health risk for marine recreational waters of 19 illnesses per 1,000 exposed individuals and for fresh recreational waters of 8 illnesses per 1,000 exposed individuals, as set by the US EPA (US EPA, 1986). The targets apply throughout the year. The final compliance point for the targets is the point at which the effluent from a discharge initially mixes with the receiving water. Implementation of the above bacteria objectives and the associated TMDL numeric targets is achieved using a 'reference system/anti-degradation approach' rather than the alternative 'natural sources exclusion approach' or strict application of the single sample objectives. As required by the CWA and Porter-Cologne Water Quality Control Act, Basin Plans include beneficial uses of waters, water quality objectives to protect those uses, an anti-degradation policy, collectively referred to as water quality standards, and other plans and policies necessary to implement water quality standards. This TMDL includes waste load allocations, which shall be incorporated into National Pollutant Discharge Elimination System (NPDES) permits and load allocations, which will be incorporated into Waste Discharge Requirements. The 'reference system/anti-degradation approach' means that on the basis of historical exceedance levels at existing monitoring locations, including a local reference beach within Santa Monica Bay, a certain number of daily exceedances of the single sample bacteria objectives are permitted. The allowable number of exceedance days is set such that (1) bacteriological water quality at any site is at least as good as at a designated reference site within the watershed and (2) there is no degradation of existing bacteriological water quality. This approach recognizes that there are natural sources of bacteria that may cause or contribute to exceedances of the single sample objectives and that it is not the intent of the Regional Board to require treatment or diversion of natural coastal creeks or to require treatment of natural sources of bacteria from undeveloped areas. The geometric mean targets may not be exceeded at any time. The rolling 30-day geometric means will be calculated on each day. If weekly sampling is conducted, the weekly sample result will be assigned to the remaining days of the week in order to calculate the daily rolling 30-day geometric mean. For the single sample targets, each existing monitoring site is assigned an allowable number of exceedance days for three time periods (1) summer dry-weather (April 1 to October 31), (2) winter dry-weather (November 1 to March 31), and (3) wet-weather (defined as days with 0.1 inch of rain or greater and the three days following the rain event.)

Element	Key Findings and Regulatory Provisions
Source Analysis	Fecal coliform bacteria may be introduced from a variety of sources including septic systems, runoff, animal wastes, and land-use runoff from both developed and undeveloped areas. An inventory of possible point and nonpoint sources of fecal coliform bacteria to the waterbody was compiled, and both simple methods and computer modeling were used to estimate bacteria loads for those sources. Source inventories were used in the analysis to identify all potential sources within the Malibu Creek watershed, modeling was used to identify the potential delivery of pathogens into the creeks and the lagoon
Loading Capacity	Studies show that bacterial degradation and dilution during transport from the watershed to the receiving water do not significantly affect bacterial indicator densities. Therefore, the loading capacity is defined in terms of bacterial indicator densities, which is the most appropriate for addressing public health risk, and is equivalent to the numeric targets, listed above. As the numeric targets must be met at the point where the effluent from storm drains or other discharge initially mixes with the receiving water throughout the day, no degradation or dilution allowance is provided.
Waste Load Allocations *(for point sources)*	Waste Load Allocations (WLAs) are expressed as the number of daily or weekly sample days that may exceed the single sample limits or 30-day geometric mean limits as identified under "Numeric Target." WLAs are expressed as allowable exceedance days because the bacterial density and frequency of single sample exceedances are the most relevant to public health protection. Zero days of exceedance are allowed for the 30-day geometric mean limits. The allowable days of exceedance for the single sample limits differ depending on season, dry weather or wet weather, and by sampling locations as described in Table 7-10.2. The allowable number of exceedance days for a monitoring site for each time period is based on the lesser of two criteria (1) exceedance days in the designated reference system and (2) exceedance days based on historical bacteriological data at the monitoring site. This ensures that bacteriological water quality is at least as good as that of a largely undeveloped system and that there is no degradation of existing water quality. For each monitoring site, allowable exceedance days are set on an annual basis as well as for three time periods. These three periods are: 1. summer dry weather (April 1 to October 31) 2. winter dry weather (November 1 to March 31) 3. wet weather (defined as days of 0.1 inch of rain or more plus three days following the rain event). The responsible jurisdictions and responsible agencies are the County of Los Angeles, County of Ventura, the cities of Malibu, Calabasas, Agoura Hills, Hidden Hills, Simi Valley, Westlake Village, Thousand Oaks, and the California Department of Transportation (Caltrans).

Element	Key Findings and Regulatory Provisions
	These jurisdictions are jointly responsible for compliance with the WLA and are known collectively as the "jurisdictional unit" for the Malibu Creek Watershed.[2] The County of Los Angeles is the primary jurisdiction because most of the watershed is in the unincorporated portion of Los Angeles County. As discussed in "Source Analysis", discharges from Tapia WWRF and effluent irrigation, and general construction storm water permits are not expected to be a significant source of bacteria. Therefore, the WLAs for these discharges are zero (0) days of allowable exceedances for all three time periods both for the single sample limits and the rolling 30-day geometric mean.
Load Allocations *(for nonpoint sources)*	Load Allocations are expressed as the number of daily or weekly sample days that may exceed the single sample limits or 30-day geometric mean limits as identified under "Numeric Target." LAs are expressed as allowable exceedance days because the bacterial density and frequency of single sample exceedances are the most relevant to public health protection. Zero days of exceedance are allowed for the 30-day geometric mean limits. The allowable days of exceedance for the single sample limits differ depending on season, dry weather or wet weather, and by sampling locations as described in Table 7-10.2. The allowable number of exceedance days for a monitoring site for each time period is based on the lesser of two criteria (1) exceedance days in the designated reference system and (2) exceedance days based on historical bacteriological data at the monitoring site. This ensures that bacteriological water quality is at least as good as that of a largely undeveloped system and that there is no degradation of existing water quality. For each monitoring site, allowable exceedance days are set on an annual basis as well as for three time periods. These three periods are: 1. summer dry weather (April 1 to October 31) 2. winter dry weather (November 1 to March 31) 3. wet weather (defined as days of 0.1 inch of rain or more plus three days following the rain event). The responsible agencies for load allocations are the county and city health departments and/or other local agencies that regulate on-site sewage treatment systems pursuant to a Memorandum of Understanding with the Regional Board and owners of on-site sewage treatment systems subject to Waste Discharge Requirements.

[2] For the purposes of this TMDL, "jurisdictional unit" includes a local or state agency that (1) is a permittee or co-permittee on a municipal storm water permit, or (2) has jurisdiction over the Malibu Creek Watershed.

Element	Key Findings and Regulatory Provisions
Implementation	The regulatory mechanisms used to implement the TMDL will include the Los Angeles County Municipal Storm Water NPDES Permit (MS4), Ventura County Municipal Storm Water NPDES Permit, the Caltrans Storm Water Permit, waste discharge requirements (WDRs), general NPDES permits, general industrial storm water permits, general construction storm water permits, and the authority contained in Sections 13263 and 13267 of the Water Code. Each NPDES permit assigned a WLA shall be reopened or amended at reissuance, in accordance with applicable laws, to incorporate the applicable WLAs as a permit requirement. Load allocations for nonpoint sources will be incorporated into Waste Discharge Requirements and MOUs with local agencies that regulate single-family onsite sewage treatments systems. This TMDL will be implemented in two phases over a ten-year period as outlined in Table 7-10.3. Within six years of the effective date of the TMDL, compliance with the allowable number of winter dry-weather exceedance days and the rolling 30-day geometric mean targets must be achieved. Within ten years of the effective date of the TMDL, compliance with the allowable number of wet-weather exceedance days and rolling 30-day geometric mean targets must be achieved. To be consistent with the Santa Monica Bay (SMB) Beaches TMDLs, the Regional Board intends to revise this TMDL, in conjunction with the revision of the SMB beaches TMDLs. The SMB Beaches TMDLs are scheduled to be revised in four years: to re-evaluate the allowable winter dry-weather and wet-weather exceedance days based on additional data on bacterial indicator densities in the wave wash; to re-evaluate the reference system selected to set allowable exceedance levels; and to re-evaluate the reference year used in the calculation of allowable exceedance days. This TMDL is scheduled to be revised in three years from the effective date which will approximately coincide with the Santa Monica Bay TMDLs
Margin of Safety	A margin of safety has been implicitly included through the following conservative assumptions. • The watershed loadings were based on the 90th percentile year for rain (1993) based on the number of wet weather days. This should provide conservatively high runoff from different land uses for sources of storm water loads • The watershed loadings were also based on a very dry rain year (1994). This ensures compliance with the numeric target during low flows when septic systems and dry urban runoff loads are the major bacterial sources. • The TMDL was based on meeting the fecal 30-day geometric mean target of 200 MPN/ 100 ml, which for this watershed was estimated to be a more stringent target than the allowable number of exceedance days for the single sample targets. This approach also provides assurance that the E. coli single sample standard will not be exceeded. • The load reductions established in this TMDL were based on reductions required during the two different critical year conditions. A wet year when storm loads are high, and a more typical dry year when base flows and

Element	Key Findings and Regulatory Provisions
	assimilative capacity is low. This adds a margin of safety for more typical years. In addition, an explicit margin of safety has been incorporated, as the load allocations will allow exceedances of the single sample targets no more than 5% of the time on an annual basis, based on the cumulative allocations proposed for dry and wet weather. Currently, the Regional Board concludes that there is water quality impairment if more than 10% of samples at a site exceed the single sample bacteria objectives annually.
Seasonal Variations and Critical Conditions	Seasonal variations are addressed by developing separate waste load allocations for three time periods (summer dry weather, winter dry weather, and wet weather) based on public health concerns and observed natural background levels of exceedance of bacterial indicators. To establish the critical condition for the wet days, we used rain data from 1993. Based on data from the Regional Board's Santa Monica Bay TMDL this represents the 90th percentile rain year based on rain data from 1947 to 2000. Use of this year provides a conservative estimate of loading from runoff. For the critical year (1993) we identified 69 wet days and 296 dry days.[3] To further evaluate the critical conditions, we modeled a representative dry year. The model was calibrated using meteorological data from 1992 to 1995. Of these years, 1994 had the greatest number of dry-weather days (310). The dry year critical condition was based on 1994, which was the 50th percentile year in terms of dry weather days for the period of 1947-2000.
Compliance Monitoring	Responsible jurisdictions and agencies shall submit a compliance monitoring plan to the Executive Officer of the Regional Board for approval. The compliance monitoring plan shall specify sampling frequency (daily or weekly) and sampling locations and that will serve as compliance points. If the number of exceedance days is greater than the allowable number of exceedance days the responsible jurisdictions and agencies shall be considered out-of-compliance with the TMDL. If the number of exceedance days exceeds the allowable number of exceedance days for a target, the responsible jurisdictions and agencies within the contributing subwatershed shall be considered out-of-compliance with the TMDL. Responsible jurisdictions or agencies shall not be deemed out of compliance with the TMDL if the investigation described in the paragraph below demonstrates that bacterial sources originating within the jurisdiction of the responsible agency have not caused or

[3] This approach differs slightly from the Santa Monica Bay TMDL in that we have used the 1993 calendar year (January 1 to December 31) rather than the modified storm year (November 1 to October 31). However, this approach is consistent with the EPA Bacteria TMDL.

Element	Key Findings and Regulatory Provisions
	contributed to the exceedance. If a single sample shows the discharge or contributing area to be out of compliance, the Regional Board may require, through permit requirements or the authority contained in Water Code section 13267, daily sampling at the downstream compliance point or at the existing downstream monitoring location (if it is not already) until all single sample events meet bacteria water quality objectives. Furthermore, if a creek location is out-of-compliance as determined in the previous paragraph, the Regional Board shall require responsible agencies to initiate an investigation, which at a minimum shall include daily sampling in the target receiving waterbody reach or at the existing monitoring location until all single sample events meet bacteria water quality objectives. If bacteriological water quality objectives are exceeded in any three weeks of a four-week period when weekly sampling is performed or, for areas where testing is done more than once a week, 75% of testing days produce an exceedance of bacteria water quality objectives, the responsible agencies shall conduct a source investigation of the subwatershed(s) pursuant to protocols established under Water Code 13178. Responsible jurisdictions may wish to conduct compliance monitoring at key jurisdictional boundaries as part of this effort.

Note: The complete staff report for the TMDL is available for review upon request.

Table 7-10.2. Malibu Creek and Lagoon Bacteria TMDL: Final Annual Allowable Exceedance Days for Single Sample Limits by Sampling Location

Compliance Deadline		6 years after effective date		6 years after effective date		10 years after effective date	
		Summer Dry Weather ^		Winter Dry Weather ^*		Wet Weather ^*	
		April 1 - October 31		November 1 - March 31		November 1 - October 31	
Station ID	Location Name	Daily sampling (No. days)	Weekly sampling (No. days)	Daily sampling (No. days)	Weekly sampling (No. days)	Daily sampling (No. days)	Weekly sampling (No. days)
LA RWQCB	Triunfo Creek	0	0	3	1	17	3
LA RWQCB	Lower Medea Creek	0	0	3	1	17	3
LVMWD (R-9)	Upper Malibu Creek, above Las Virgenes Creek	0	0	3	1	17	3
LVMWD (R-2)	Middle Malibu Creek, below Tapia discharge 001	0	0	3	1	17	3
LVMWD (R-3)	Lower Malibu Creek, 3 mi below Tapia	0	0	3	1	17	3
LVMWD (R-4)	Malibu Lagoon, above PCH	0	0	3	1	17	3
LVMWD (R-11)	Malibu Lagoon, below PCH	0	0	3	1	17	3
------	Other sampling stations as identified in the Compliance Monitoring Plan as approved by the Executive Officer	0	0	3	1	17	3

Notes: The number of allowable exceedances is based on the lesser of (1) the reference system or (2) existing levels of exceedance based on historical monitoring data.
The allowable number of exceedance days during winter dry weather is calculated based on the 10th percentile storm year in terms of dry days at the LAX meteorological station
The allowable number of exceedance days during wet weather is calculated based on the 90th percentile storm year in terms of wet days at the LAX meteorological station.
^ A dry day is defined as a non-wet day. A wet day is defined as a day with a 0.1-inch or more of rain and the three days following the rain event.
* A revision of the TMDL is scheduled for three years after the TMDL's effective date in order to re-evaluate the allowable exceedance days during winter dry weather and wet weather based on additional monitoring data and the results of the study quantifying the bacteria loading from birds to the Malibu Lagoon.

Table 7-10.3. Malibu Creek and Lagoon Bacteria TMDL: Significant Dates

Date	Action
120 days after the effective date of this TMDL	Responsible jurisdictions and responsible agencies must submit a comprehensive bacteria water quality monitoring plan for the Malibu Creek Watershed to the Executive Officer of the Regional Board. The purpose of the plan is to better characterize existing water quality as compared to the Load Allocations and Waste Load Allocations in this TMDL, and ultimately, to serve as a compliance monitoring plan. The plan must include sampling locations that are to be used as compliance points.
1 year after effective date of TMDL	Responsible jurisdictions and responsible agencies shall provide a written report to the Regional Board outlining how each intends to cooperatively achieve compliance with the TMDL. The report shall include implementation methods, an implementation schedule, and proposed milestones. Responsible jurisdictions and responsible agencies shall provide the Regional Board Executive Officer, a report quantifying the bacteria loading from birds to the Malibu Lagoon.
3 years after effective date of this TMDL	The Regional Board shall reconsider this TMDL to: (1) consider a natural source exclusion for bacteria loadings from birds in the Malibu Lagoon (2) refine the allowable winter dry weather and wet weather exceedances days based on additional data on bacterial indicator densities, and an evaluation of site-specific variability in exceedance levels, (3) re-evaluate the reference system selected to set allowable exceedance levels, including a reconsideration of whether the allowable number of exceedance days should be adjusted annually dependent on the rainfall conditions and an evaluation of natural variability in exceedance levels in the reference system(s), (4) re-evaluate the reference year used in the calculation of allowable exceedance days, and (5) re-evaluate whether there is a need for further clarification of revision of the geometric mean implementation provision.
6 years after the effective date of this TMDL	Achieve compliance with the applicable Load Allocations and Waste Load Allocations, expressed as allowable exceedance days for summer dry weather (April 1 to October 31) and winter dry weather (November 1-March 31) single sample limits and the rolling 30-day geometric mean.
10 years after the effective date of this TMDL	Achieve compliance with the wet-weather Load Allocations and Waste Load Allocations (expressed as allowable exceedance days for wet weather) and compliance with the rolling 30-day geometric mean.